University of California
College of Agriculture
Agricultural Experiment Station
Berkeley, California

SEASONAL LABOR NEEDS FOR CALIFORNIA CROPS

SAN JOAQUIN COUNTY

Progress Report No. 39

by

R. L. Adams

Preliminary -- Subject to Correction

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Mimeographed Report No. 53

(Farm Labor Survey -- July-December, 1936)

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Seasonal Labor Needs for California Crops

San Joaquin County

Scope of Presentation.-- The following considerations govern the presentation of this progress report:

1. The data are confined to the area indicated above.

2. The data are confined solely to crops, livestock needs being ignored.

3. The findings apply only to occasional or seasonal labor requirements as distinguished from labor contributed by farm operators and by workers employed on a year-round or regular basis of employment.

4. Attention is concentrated upon workers required for hand tasks -- planting, thinning, weeding, hoeing, and harvesting -- without including teamsters, tractor drivers, irrigators, and shed packers of vegetables or fruits.

5. The presentation includes the so-called migratory, transient, or roving workers which comprise an important source of help needed in connection with certain tasks and at "peak" times which seasonally arise in connection with many field, truck, and fruit crops commercially produced in California.

6. This report is confined to California's need for seasonal agricultural workers because of the more pressing problems liable to arise in connection therewith. A later study is planned which will deal with other kinds of labor involved in the production of California's many crops.

Brief Description of the Area.-- San Joaquin County lies directly east of San Francisco and San Pablo bays and spans the San Joaquin Valley from the Coast Range to the foothills of the Sierra Nevada Mountains. Stockton, the principal city in the county, is about 60 miles east of San Francisco. San Joaquin County lies directly south of Sacramento County. In the northwest corner there is a continuation of the delta covering an area about 30 miles long and 15 miles wide. This area is treated separately from the rest of the county in the report on the entire delta region. The remaining agricultural land in the county is of slightly higher elevation than that lying in the delta.

Near the northern boundary of the county about 15 miles from the Calaveras-San Joaquin county line on the east is a section of intensively developed grape and fruit farming, known as the Lodi section; this covers an area about 15 miles square. Another intensively developed farming section is located near the southern boundary adjacent to Stanislaus County about midway between the eastern and western boundaries of San Joaquin County. It is contiguous to the Stanislaus River and extends east and west about 30 miles and north about 15 to 20 miles. Soils in this district are mainly light in character and the topography varies from flat to rolling. Fruit growing and intensive truck farming are carried on within this section with some alfalfa being raised. A third farming section is located around Tracy and Bethany just south of the delta. There are about 15,000 acres of land ranging in elevation from 80 to 160 feet above sea level. The principal soils are Yolo adobes, loams, and clay loams, all of which are very deep and fertile. This section is devoted to alfalfa and field crops, principally beans. The remainder of the arable land in the county is either used for grazing or dry-farmed to grain.

(Farm Labor Survey -- July-December, 1938)

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Crops, Acreages, and Production.-- The basis used in calculating occasional or seasonal need for labor, other than that furnished by farm operators and regularly employed workers, appears as table 1. This does not include that portion of the county which lies in the delta, since the delta, including portions of five counties, has been considered as a separate unit in Progress Report No. 59.

TABLE 1

Basis for Calculating Seasonal Labor Requirements
San Joaquin County (Excluding Delta)

Crops	Acreage*	Production*
Field crops:		
Alfalfa	28,507	171,042 tons
Beans	31,932	456,627 cwt.
Clover†	3,442	--
Corn -- field	1,726	2,157 tons
Cow peas†	206	--
Grain -- wheat, barley, oats and rye	147,465	--
Flax	412	3,832 bushels
Grain sorghums	6,961	8,700 tons
Hay -- mostly grain hay	25,834	41,251 tons
Hops	64	96,000 pounds (dry weight)‡
Onions -- mostly early	1,161	232,200 cwt.
Potatoes -- Irish	362	56,110 cwt.
sweet	818	3,272 tons
Rice	1,640	42,640 cwt.
Silage†	428	--
Sudan grass†	1,986	Mostly pastured -- some for hay and seed
Sugar beets	986	16,762 tons
Sunflowers	1,935	18,789 cwt.
Seed crops:		
Carrot seed	40	--
Lettuce seed	58	--
Onion seed	188	--
Onion sets	2	--
Parsnip seed	7	--
Sugar beet seed	61	--
Swiss chard seed	40	--
Vegetable crops:		
Asparagus	1,903	(1,712,900 pounds fresh (3,996,300 pounds to canneries
Beets†	80	--
Carrots	269	107,600 crates
Celery†	26	--
Cucumbers	150	--
Lettuce	389	50,570 crates

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TABLE 1

Basis for Calculating Seasonal Labor Requirements
San Joaquin County (Excluding Delta)

Crops	Acreage	Production
Field crops:		
Alfalfa	28,807	171,042 tons
Beans	31,952	465,827 cwt.
Clover†	5,442	--
Corn -- field	1,726	2,167 tons
Cow peas†	206	--
Grain -- wheat, barley, oats and rye	147,485	--
Flax	412	3,882 bushels
Grain sorghums	8,981	5,700 tons
Hay -- mostly grain hay	25,884	41,261 tons
Hops	84	96,000 pounds (dry weight)†
Onions -- mostly early	1,161	232,200 cwt.
Potatoes -- Irish	562	86,110 cwt.
sweet	818	5,272 tons
Rice	1,640	42,640 cwt.
Silage†	428	--
Sudan grass†	1,986	Mostly pastured -- some for hay and seed
Sugar beets	986	15,762 tons
Sunflowers	1,938	18,789 cwt.
Seed crops:		
Carrot seed	40	--
Lettuce seed	52	--
Onion seed	188	--
Onion sets	2	--
Parsnip seed	7	--
Sugar beet seed	61	--
Swiss chard seed	40	--
Vegetable crops:		
Asparagus	1,908	(1,712,800 pounds fresh (5,996,300 pounds to canneries
Beets†	80	--
Carrots	269	107,600 crates
Celery†	26	--
Cucumbers	150	--
Lettuce	589	50,870 crates

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Table 1 continued.

Crops	Acreage*	Production*
Vegetable crops cont'd.		
Peas -- green	1,711	169,000 hampers
Pumpkins	422	--
Spinach	1,513	5,750 tons
Squash	239	--
Sweet corn †	38	--
Tomatoes	9,013	41,460 tons (38,210 tons canned (130,000 lugs shipped ϕ
Miscellaneous vegetables	2,243	--
Watermelons	1,850	11,100 tons
Cantaloupes	230	25,760 crates
Honeydews	220	2,640 tons
Casabas	280	3,080 tons
Persians	320	3,200 tons
Fruit and nut crops:		
Almonds	3,611	1,839,000 pounds
Apples †	28	4,200 boxes
Apricots	1,731	7,631 tons (50 per cent dried)
Cherries -- fresh	3,261	290,000 Campbell lugs of 15 pounds net
canning	1,136	2,522 tons
Figs	547	547 tons
Grapes -- Tokay	17,016	2,415,774 packages (fresh) 105,452 tons (wine)
juice	32,430	57,638 tons (shipped) 77,506 tons (wine)
raisin (nearly all seedless)	702	3,000 tons (fresh weight)
other table grapes	1,663	130,000 packages (fresh) 6,828 tons (wine)
Olives	318	636 tons of which 540 tons canned
Peaches -- cling	3,403	21,439 tons (15 per cent dried)
free	2,794	15,926 tons (75 per cent dried)
Pears †	48	144 tons
Plums	2,360	339,840 crates
Prunes	645	806 tons (dry weight) ‡
Walnuts	8,752	2,013 tons
Chestnuts †	193	338 tons
Strawberries	120	33,000 crates

* Acreage and production figures are from A. E. Mahoney, Agricultural Commissioner, San Joaquin County, acreages in the delta having been deducted from the total county acreage.

† Use of seasonal labor inconsequential on these crops and hence has been ignored.

‡ Drying ratios estimated to be as follows:

Apricots	5.5 to 1	Prunes	2.25 to 1
Peaches	5.5 to 1	Hops	4 to 1

ϕ Production of shipping tomatoes estimated at 200 lugs per acre on 650 acres of shipping varieties.

Table I continued.

Crops	Acres*	Production*
Vegetable crops cont'd.		
Peas -- green	1,711	189,000 hampers
Pumpkins	412	--
Spinach	1,[illegible]	[illegible],756 tons
Squash	239	--
Sweet corn †	86	--
Tomatoes	9,013	41,440 tons (38,210 tons canned (130,000 lugs shipped ‡
Miscellaneous vegetables	2,245	--
Watermelons	1,880	11,100 tons
Cantaloupes	230	26,780 crates
Honeydews	280	2,040 tons
Casabas	280	3,080 tons
Persians	320	3,200 tons
Fruit and nut crops:		
Almonds	3,611	1,859,000 pounds
Apples †	28	4,200 boxes
Apricots	1,731	7,823 tons (80 per cent dried)
Cherries -- fresh	3,241	290,000 Dunphell lugs of 18 pounds net
canning	1,188	2,822 tons
Figs	647	647 tons
Grapes -- raisin	17,016	2,416,774 packages (fresh) 106,482 tons (wine)
table	32,450	87,658 tons (shipped) 77,806 tons (wine)
raisin (nearly all seedless)	702	3,000 tons (fresh weight)
other table grapes	1,065	130,000 packages (fresh) 6,898 tons (wine)
Olives	318	838 tons of which 540 tons canned
Lemons -- oiling	3,405	21,439 tons (18 per cent dried)
fresh	2,794	16,928 tons (18 per cent dried)
Pears †	48	144 tons
Plums	2,360	232,840 crates
Prunes	846	806 tons (dry weight) ‡
Walnuts	8,752	3,015 tons
Chestnuts †	193	338 tons
Strawberries	120	32,800 crates

* Acreage and production figures are from A. E. Mahoney, Agricultural Commissioner, San Joaquin County, acreages in the delta having been deducted from the total county acreages.

† Use of seasonal labor inconsequential on these crops and hence has been ignored.

‡ Drying ratios estimated to be as follows:

Apricots	5.6 to 1	Prunes	2.25 to 1
Peaches	5.5 to 1	Hops	4 to 1

§ Production of shipping tomatoes estimated at 200 lugs per acre on 850 acres of shipping varieties.

Operations Requiring Seasonal Labor and Times of Need.-- Farm operations requiring the use of seasonal labor for the various crops raised in San Joaquin County (excluding that part of the county lying in the delta) are indicated in table 2. This tabulation does not include the employing of shed workers needed to wash, pack and prepare various commodities for shipping and marketing.

TABLE 2

Operations Requiring Use of Seasonal Labor and Times of Needs by Crops
San Joaquin County (Excluding Delta Lands)

Crop	Operation	Time of need by months	Per cent of work done by seasonal help	Output per man-day
Field crops: Alfalfa	Mowing -- 50 per cent by tractor *	Apr. 15-30 -- one-half of acreage May 1-Sept. 30 -- all of acreage	50	(20 acres with tractor 7.5 acres with horses)
	Raking	Oct. 1-15 -- one-half of acreage	50	20 acres
	Shocking -- with rake		50	30 acres
	Baling -- 75 per cent of crop	May 1-Oct. 31 -- one sixth of job each month	50	5 tons
Corn -- field	Picking, husking and hauling to cribs	Oct. 1-31 -- 15 per cent of acreage Nov. 1-30 -- 40 per cent of acreage Dec. 1-31 -- 40 per cent of acreage Jan. 1-10 -- 5 per cent of acreage	100	0.75 acre
Grain -- Wheat, barley, oats, rye and flax	Harvesting	June -- 70 per cent of acreage July -- 30 per cent of acreage	60	7 acres
Grain sorghums	Harvesting (with combine)-- 50 per cent of acreage	October -- all of job	50	2.5 acres
	Cutting off heads by hand -- 50 per cent of acreage	October -- all of job	50	1 acre
	Threshing (with stationary machine) -- 50 per cent of crop	October -- all of job	50	100 cwt.

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Crop	Operation	Time of need by months	Number of men work done by seasonal help	Output per man-day
Field crops: Alfalfa	Mowing -- 80 per cent by tractor *	Apr. 1-30 -- one-half of average May 1-Sept. 30 -- all of average	50	(20 acres with tractor 7.5 acres with horses)
	Raking	Oct. 1-15 -- one-half of average	50	20 acres
	Shocking -- with rake		50	30 acres
	Baling -- 75 per cent of crop	May 1-Oct. 31 -- one sixth of job each month	50	5 tons
Corn -- field	Plowing, bucking and hauling to cribs	Oct. 1-31 -- 15 per cent of average Nov. 1-30 -- 40 per cent of average Dec. 1-31 -- 40 per cent of average Jan. 1-10 -- 5 per cent of average	100	0.75 acre
Grain -- Wheat, barley, oats, rye and flax	Harvesting	June -- 70 per cent of average July -- 30 per cent of average	50	7 acres
Grain sorghum	Harvesting (with combine)-- 50 per cent of average	October -- all of job	50	2.5 acres
	Cutting off heads by hand -- 50 per cent of average	October -- all of job	50	1 acre
	Threshing (with stationary machine) -- 50 per cent of crop	October -- all of job	50	100 cwt.

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Table 2 continued.

Crop	Operation	Time of need by months	Per cent of work done by seasonal help	Output per man-day
Field crops cont'd:				
Hay -- mostly grain hay	Mowing Raking Shocking	May 1-31 -- 90 per cent of acreage June 1-7 -- 10 per cent of acreage	50	7.5 acres* 15 acres 30 acres
	Baling -- 90 per cent of crop	May 1-31 -- 50 per cent of job June 1-30 -- 50 per cent of job	100	5 tons
Hops	Training vines	May 1-31 -- 2 times on all acreage June 1-15 -- 1 time on all acreage	70	Total of 6 man-days per acre
	Picking	Aug. 7-31 -- all of crop	100	200 pounds green weight
	Drying	Aug. 7-31 -- all of crop	50	2,800 pounds green weight
	Baling	Sept. 1-7 -- all of crop	60	12 bales (190 pounds dry weight)
Onions	Weeding (2 to 4 times)	Mar. -- 2 man-days per acre Apr. -- 4 man-days per acre May -- 4 man-days per acre	100	Varies greatly -- Est. 10 man-days per acre
	Pulling, topping and sacking	July 20-31 -- 25 per cent of crop Aug. 1-31 -- 50 per cent of crop Sept. 1-15 -- 25 per cent of crop	100	30 cwt.
Potatoes -- sweet	Planting	Apr. 25-30 -- 15 per cent of acreage May 1-31 -- 85 per cent of acreage	50	0.6 acre
	Hoeing (twice)	June -- all of acreage July -- all of acreage	25	4.0 acres
	Picking up, piling, breaking and boxing	Aug. 15-31 -- 10 per cent of crop Sept. 1-30 -- 40 per cent of crop Oct. 1-31 -- 40 per cent of crop Nov. 1-15 -- 10 per cent of crop	50	0.15 acre
Rice	Windrowing	Sept. 15-30 -- 33 per cent of acreage Oct. 1-31 -- 66 per cent of acreage	50	10 acres

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Table 2 continued.

Crop	Operation	Time of need by months	Per cent of work done by seasonal help	Output per man-day
Field crops cont'd: Rice cont'd.	Threshing with pick-up combine	Sept. 15-30 -- 20 per cent of acreage Oct. 1-31 -- 80 per cent of acreage	50	4.5 acres
	Picking up sacks and hauling from field	Sept. 15-30 -- 20 per cent of crop Oct. 1-31 -- 80 per cent of crop	100	500 sacks
Sugar beets	Thinning	Mar. -- 20 per cent of acreage Apr. -- 30 per cent of acreage May -- 30 per cent of acreage June -- 20 per cent of acreage	100	0.5 acre
	Hoeing (3 or 4 times)	June -- all of acreage July -- all of acreage Aug. -- all of acreage	100	1.5 acre
	Harvesting -- topping and loading	Sept. -- 20 per cent of crop Oct. -- 25 per cent of crop Nov. -- 25 per cent of crop Dec.-- 30 per cent of crop	100	6.0 tons
Sunflowers	Thinning and hoeing	Apr. 15-30 -- one-third of acreage May 1-31 -- two-thirds of acreage	100	1.0 acre
	Cutting off heads by hand	Aug. 15-31 -- 20 per cent of acreage Sept. 1-30 -- 60 per cent of acreage Oct. 1-31 -- 20 per cent of acreage	100	1.0 acre
	Picking up and piling heads	Sept. 1-31 -- 50 per cent of acreage Oct. 1-31 -- 50 per cent of acreage	100	1.0 acre
	Threshing	Sept. 1-30 -- 50 per cent of crop Oct. 1-31 -- 50 per cent of crop	80	5.0 acres (or about 5,000 lbs.)

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Crop	Operation	Time of need by months	Per cent of work done by seasonal help	Output per man-day
Seed crops: Carrot seed	Transplanting	Dec. -- one-third of acreage Jan. -- one-third of acreage Feb. -- one-third of acreage	100	0.5 acre
	Hoeing (2 times)	Mar. 15-31 -- 40 per cent of acreage Apr. 1-30 -- 80 per cent of acreage May 1-31 -- 80 per cent of acreage	100	0.75 acre
	Cutting by hand and piling	Aug. 20-31 -- 50 per cent of acreage Sept. 1-20 -- 50 per cent of acreage	100	0.4 acre
	(Dry on sheets) Threshing, screening and sacking	Sept. -- all of job	50	0.33 acre
Lettuce seed	Thinning and hoeing	Mar. 15-31 -- 25 per cent of acreage Apr. 1-30 -- 50 per cent of acreage May 1 - 15 -- 25 per cent of acreage	100	0.5 acre
	Hoeing	May 1-31 -- two-thirds of acreage June 1-15 -- one-third of acreage	100	0.5 acre
	Cutting and throwing on wagons	July -- 10 per cent of acreage Aug. -- 80 per cent of acreage Sept. -- 10 per cent of acreage	100	0.33 acre
	Threshing -- by rolling, rough screening and sacking	Aug. -- 80 per cent of acreage Sept. -- 20 per cent of acreage	50	0.5 acre

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Crop	Operation	Time of need by months	Per cent of work done by seasonal help	Output per man-day
Seed crops cont'd: Onion seed	Planting bulbs	Dec. 1-31 -- one-third of acreage Jan. 1-31 -- one-third of acreage Feb. 1-28 -- one-third of acreage	100	0.20 acre
	Hoeing (2 times)	March -- one-third of job Apr. -- one-third of job May -- one-third of job	100	Total of 50 hours per acre
	Picking	July 20-31 -- two-thirds of acreage Aug. 1-5 -- one-third of acreage	100	0.20 acre
	Threshing -- by rolling, hand screening and sacking	Aug. -- all of acreage	50	0.4 acre
Beet seed	Planting 30 inches x 30 inches	Dec. 15-31 -- 25 per cent of acreage Jan. 1-31 -- 75 per cent of acreage	100	0.75 acre
	Hoeing (first time)	Mar. 1-31 -- two-thirds of acreage Apr. 1-15 -- one-third of acreage	100	0.75 acre
	Hoeing (second time)	Apr. 15-30 -- one-half of acreage May 1-15 -- one-half of acreage	100	1.5 acres
	Clipping off tops of seed stalks with knife	May -- all acreage	100	5.0 acres
	Cutting off branches (trimming) and laying in piles	Aug. -- all of acreage	100	0.5 acre
	Threshing	Aug. 15-31 -- 80 per cent of acreage Sept. 1-7 -- 20 per cent of acreage	80	1.8 acres (or about 1,800 lbs.)

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Crop	Operation	Time of need by months	Per cent of work done by seasonal help	Output per man-day
Vegetable crops:				
Asparagus -- Practically all in delta district, or closely adjacent thereto, and therefore not included in this report. See "Delta" report.				
Carrots	Pulling, tying, and putting in crates	Jan. -- 10 per cent of crop Feb. -- 7 per cent of crop May -- 30 per cent of crop June -- 34 per cent of crop Nov. -- 4 per cent of crop Dec. -- 13 per cent of crop Balance scattering and inconsequential	100	12 packed crates
Cucumbers	Hoeing (3 times)	May -- 50 per cent of job June -- 50 per cent of job	100	Total of 20 hrs. per acre (varies greatly)
	Picking	July 15-31 -- all of acreage Aug. 1-31 -- all of acreage Sept. 1-15 -- all of acreage	100	Requires one man on each two acres continuously
Peas -- green	Hoeing (2 times)	Feb. -- all of acreage Mar. -- all of acreage	100	1.0 acre
	Picking	Apr. 19-30 -- 30 per cent of crop May 1-18 -- 70 per cent of crop	100	10 hampers
Spinach	Hoeing	Jan. -- 50 per cent of acreage Feb. -- 50 per cent of acreage	100	0.75 acre
	Picking up and crating	Mar. 15-31 -- 50 per cent of crop Apr. 1-15 -- 50 per cent of crop	100	4 tons
Tomatoes	Transplanting	Feb. 15-28 -- all of job	80	5,000 plants
	Planting in fields	May 1-15 -- by regular help	--	--
	Hoeing (2 times)	May -- two-thirds of acreage June -- two-thirds of acreage July -- two-thirds of acreage	100	1.0 acre

Table continued on next page

Crop	Operation	Time of need by months	Per cent of work done by seasonal help	Output per man-day
Tomatoes cont'd:	Picking for canning	Aug. -- 15 per cent of crop Sept. -- 45 per cent of crop Oct. -- 40 per cent of crop (Canning sometimes extends into November)	100	1,500 lbs.
	Picking for shipping	July 1-31 -- 17 per cent of crop Aug. 1-31 -- 30 per cent of crop Sept. 1-30 -- 6 per cent of crop Oct. 1-31 -- 40 per cent of crop Nov. 1-31 -- 4 per cent of crop Dec. 1-31 -- 3 per cent of crop	100	45 pkd. lugs
Watermelons	Picking	July 10-31 -- 30 per cent of crop Aug. 1-31 -- 60 per cent of crop Sept. 1-15 -- 10 per cent of crop	100	20 tons
Cantaloupes	Picking	July 1-31 -- 90 per cent of crop Aug. 1-7 -- 10 per cent of crop	100	40 crates of about 80 pounds
Casabas and honeydews mostly picked by regular employees.				
Fruit and nut crops: Almonds	Knocking	Aug. 15-31 -- one-third of crop Sept. 1-30 -- two-thirds of crop	100	300 pounds
	Hulling with machine	Aug. 15-31 -- one-third of crop Sept. 1-30 -- two-thirds of crop	50	500 pounds
Apricots	Pruning	Dec. 1-31 -- one-third of acreage Jan. 1-31 -- one-third of acreage Feb. 1-28 -- one-third of acreage	75	0.25 acre

Table continued on next page

Crop	Operation	Time of need by months	Per cent of work done by seasonal help	Output per man-day
Apricots cont'd:	Thinning	Apr. 15-30 -- 50 per cent of acreage¶ May 1-15 -- 50 per cent of acreage	100	0.25 acre
	Picking	June 10-30 -- 70 per cent of crop July 1-15 -- 30 per cent of crop	100	1,750 lbs.
	Cutting for drying -- 50 per cent of crop	June 10-30 -- 70 per cent of crop July 1-15 -- 30 per cent of crop	100	1,000 lbs.
	Other labor in dry yards	June 10-30 -- 60 per cent of job July 1-20 -- 40 per cent of job	100	11 hours per fresh ton ‖
Cherries	Pruning	Nov. -- 5 per cent of acreage Dec. -- 10 per cent of acreage Jan. -- 20 per cent of acreage Feb. -- 40 per cent of acreage Mar. -- 25 per cent of acreage	100	0.6 acre = 30 trees
	Picking for canning or barrelling	May 24-31 -- 50 per cent of crop June 1-7 -- 50 per cent of crop	100	200 pounds
	Picking for shipping	May -- 40 per cent of shipments June -- 60 per cent of shipments	100	180 pounds (12 lugs when packed)
	Packing for shipment	May 1-31 -- 40 per cent of shipments June 1-10 -- 60 per cent of shipments	100	225 pounds = 15 lugs
Grapes (Tokay and other table varieties)	Pruning	Dec. 1-31 -- 20 per cent of acreage Jan. 1-31 -- 40 per cent of acreage Feb. 1-28 -- 40 per cent of acreage	50	0.5 acre

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[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Table 2 continued.

Crop	Operation	Time of need by months	Per cent of work done by seasonal help	Output per man-day
Grapes (Tokay etc.) cont'd	Hoeing	Mar. 15-31 -- one-third of acreage Apr. 1-30 -- two-thirds of acreage	25	5 acres
	Thinning -- on 50 per cent of Tokay acreage only	May 20-30 -- 20 per cent of Tokay acreage June 1-15 -- 30 per cent of Tokay acreage	100	0.33 acre
	Picking and packing for shipment	Sept. 1-30 -- 33 per cent of shipments Oct. 1-31 -- 60 per cent of shipments Nov. 1-15 -- 7 per cent of shipments	100	900 pounds = 30 display lugs
	Picking for winery (stripping)	Sept. 1-30 -- 10 per cent of tonnage Oct. 1-31 -- 50 per cent of tonnage Nov. 1-30 -- 40 per cent of tonnage	100	2 tons
Grapes (juice varieties)	Pruning	Dec. 1-31 -- 20 per cent of acreage Jan. 1-31 -- 40 per cent of acreage Feb. 1-28 -- 40 per cent of acreage	50	0.75 acre
	Hoeing	Mar. 15-31 -- one-third of acreage Apr. 1-30 -- two-thirds of acreage	25	5 acres
	Picking for shipping	Sept. 1-30 -- 33 per cent of shipments Oct. 1-31 -- 60 per cent of shipments Nov. 1-15 -- 7 per cent of shipments	100	80 boxes = 1 ton
	Picking for winery	Sept. 1-30 -- 30 per cent of tonnage Oct. 1-31 -- 40 per cent of tonnage Nov. 1-30 -- 30 per cent of tonnage	100	2 tons

Table continued on next page

Crop	Operation	Time of need by months	Per cent of work done by seasonal help	Output per man-day
Fruit and nut crops cont'd: Grapes -- Raisin (nearly all seedless varieties)	Pruning	Dec. 1-31 -- 20 per cent of acreage Jan. 1-31 -- 40 per cent of acreage Feb. 1-28 -- 40 per cent of acreage	50	0.75 acre
	Picking for both drying and winery	Sept. 15-30 -- 80 per cent of crop Oct. 1-7 -- 20 per cent of crop	100	2,400 pounds
Olives	Picking for pickling	Oct. 15-31 -- 25 per cent of job Nov. 1-30 -- 75 per cent of job	100	275 pounds
	Picking for oil	Dec. 1-31 -- 40 per cent of job Jan. 1-31 -- 40 per cent of job Feb. 1-15 -- 20 per cent of job	100	400 pounds
Peaches -- clingstone	Pruning	Dec. 1-31 -- 15 per cent of acreage Jan. 1-31 -- 35 per cent of acreage Feb. 1-28 -- 35 per cent of acreage Mar. 1-15 -- 15 per cent of acreage	50	0.25 acre
	Brush burned by regular help or disked under.			
	Thinning	May 1-31 -- 75 per cent of acreage June 15-30 -- 25 per cent of acreage	100	0.2 acre
	Smudging	Mar. 24 to May 10	100	Must have one man available for each 10 acres
	Picking	Aug. 1-31 -- 80 per cent of crop Sept. 1-10 -- 20 per cent of crop	100	1 ton

Table continued on next page

Crop	Operation	Time of need by months	Per cent of work done by seasonal help	Output per man-day
Peaches, clingstone cont'd:	Cutting for drying -- 15 per cent of crop	Aug. 1-31 -- 80 per cent of job Sept. 1-10 -- 20 per cent of job	100	600 pounds = 24 boxes
	Other labor in dry yard	Aug. 1-31 -- 75 per cent of job Sept. 1-15 -- 25 per cent of job	100	11½ hours per fresh ton //
Peaches, freestone	Pruning	Dec. 1-31 -- 15 per cent of acreage Jan. 1-31 -- 35 per cent of acreage Feb. 1-28 -- 35 per cent of acreage Mar. 1-15 -- 15 per cent of acreage	50	0.25 acre
	Thinning	May 1-31 -- all of acreage	100	0.2 acre
	Smudging	Mar. 24 to May 10	100	Must have one man available for each 10 acres
	Picking for shipment -- 25 per cent of crop	July 20-30 -- 15 per cent of job Aug. 1-31 -- 50 per cent of job Sept. 1-30 -- 30 per cent of job Oct. 1-31 -- 5 per cent of job	100	2,000 pounds
	Packing -- 25 per cent of crop	July 20-30 -- 15 per cent of job Aug. 1-31 -- 50 per cent of job Sept. 1-30 -- 30 per cent of job Oct. 1-31 -- 5 per cent of job	100	100 boxes = 3,000 lbs.
	Picking for drying	Aug. 1-31 -- all of job	100	3,000 pounds
	Cutting for drying	Aug. 1-31 -- all of job	100	2,000 pounds
	Other dry yard work	Aug. 1-31 -- 80 per cent of job Sept. 1-7 -- 20 per cent of job	100	11½ hours per fresh ton //

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[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Crop	Operation	Time of need by months	Per cent of work done by seasonal help	Output per man-day
Fruit and nut crops cont'd: Plums	Pruning -- 50 per cent of acreage	Dec. -- 10 per cent of acreage Jan. -- 40 per cent of acreage Feb. -- 40 per cent of acreage Mar. -- 10 per cent of acreage	50	0.5 acre
	Thinning	Apr. 15-30 -- 50 per cent of acreage May 1-15 -- 50 per cent of acreage	100	0.33 acre
	Picking	June 23-30 -- 1 per cent of crop July 1-31 -- 67 per cent of crop Aug. 1-31 -- 32 per cent of crop	100	25 crates of 28 lbs. = 700 lbs.
	Packing done in shipping sheds			
Prunes	Pruning	Dec. -- 40 per cent of acreage Jan. -- 40 per cent of acreage Feb. -- 20 per cent of acreage	25	0.25 acre
	Thinning (on sugar prunes only) -- 50 per cent of acreage	April 15-30 -- 50 per cent of job May 1-15 -- 50 per cent of job	90	0.2 acre
	Picking up	July 15-31 -- 12½ per cent of crop Aug. 1-31 -- 75 per cent of crop Sept. 1-15 -- 12½ per cent of crop	100	1,500 pounds
	Dipping and drying	July 15-31 -- 12½ per cent of crop Aug. 1-31 -- 75 per cent of crop Sept. 1-15 -- 12½ per cent of crop	25	8.3 hours per fresh ton //

Table continued on next page

Crop	Operation	Time of need by months	Per cent of work done by seasonal help	Output per man-day
Fruit and nut crops cont'd: Walnuts	Pruning -- on 50 per cent of acreage annually	Jan. -- one-third of acreage pruned Feb. -- one-third of acreage pruned Mar. -- one-third of acreage pruned	50	0.5 acre
	Spraying (2 times)	April -- one time May -- one time	25	3 acres
	Knocking off and picking up	Sept. 1-30 -- 75 per cent of crop	100	300 pounds
		Oct. 1-15 -- 25 per cent of crop	100	150 pounds
	Hulling practically all by machine with regular employees.			
Strawberries	Picking	May -- 24,000 crates June -- 9,000 crates	70	15 crates of 12 baskets

* Use of power mowers in hay cutting is apparently increasing, with consequent reduction in labor needs. These machines cut about 20 acres per day.

† Grain sorghums are usually cut by hand in the Escalon district, where fields are relatively small. Larger fields of dwarf types, however, are generally cut with "combines."

‡ Sunflower heads are sometimes picked up and threshed without piling, but the labor need is about the same either way.

§ Based on estimated pack out of one packed lug for every field lug of 50 pounds.

¶ Apricot thinning varies greatly and was light in 1935. May sometimes require 4 or 5 man-days per acre when set is heavy.

|| From Christie, A. W. and L. C. Barnard. The principles and practice of sun-drying fruit. California Agr. Exp. Sta. Bul. 388. 1925.

Findings of Seasonal Labor Needs.-- Details and summaries of seasonal requirements of San Joaquin County agriculture are presented as table 3. The "size of task" are figures drawn from table 1, in terms of either acreage or output in tons, crates, boxes, or whatever unit is commonly used. The "output per man-day" is an average figure for the entire acreage or output figured in crates, hampers, boxes or other units as indicated in the table. If the work is of a nature that requires a crew different members of which perform different tasks, then the average shown is per man based on the entire crew. Length of day is 9 hours,

November to February; 10 hours March to October, unless otherwise stated. Wide variations in output occur between farm and farm, field and field, and season and season, because of differences in soil types, climatic conditions, weeds, yields, and other factors influencing the amount of work that a laborer can perform in a given day. Moreover, the basis of output is a mature, experienced male worker without reference to use of women, children, and more or less inexperienced help that is sometimes used in connection with certain of the tasks requiring use of seasonal workers. The column headed "available days" reflects (a) limitations set from the period within which the work must be performed because of the nature of the task, such as transplanting, thinning, weeding and cutting, and (b) available days as determined by weather conditions, inclement weather reducing the number of days when a required task can be performed. The "required number of individuals" is given in terms of workers as noted above in connection with "output per man-day."

It is probable that the estimated number of workers required, as recorded in table 3, will often be too low, for the reason that "peaks" frequently occur, during which an unusually large proportion of the job is done in a very short period. This would naturally require a much greater number of workers than when the work is spread over a longer period, even though the total amount of labor (in man-days) remains the same.

TABLE 3

Seasonal Labor Needs -- San Joaquin County -- by Months and Tasks

Month	Crop and task	Size of task	Output per man-day	Required man-days	Available days	Required number of workers*
January	Corn--field: Picking, husking, and hauling to crib	87 acres	0.75 acre	116	6	20 (Jan. 1-10)
	Carrots for seed: Transplanting	13 acres	0.5 acre	26	18	2
	Onions for seed: Planting bulbs	63 acres	0.2 acre	315	18	18
	Beets for seed: Planting	46 acres	0.75 acre	62	18	4
	Carrots: Pulling, tying, and putting in crates	10,760 crates	12.0 crates	897	18	50
	Spinach: Hoeing	756 acres	0.75 acre	1,008	18	56
	Apricots: Pruning	433 acres†	0.25 acre	1,732	18	97
	Cherries: Pruning	879 acres	0.6 acre	1,465	18	82
	Grapes--Tokay and other table varieties: Pruning	3,736 acres†	0.5 acre	7,472	18	416
	Grapes--juice varieties: Pruning	6,486 acres†	0.75 acre	8,648	18	481
	Grapes--raisin varieties: Pruning	140 acres†	0.75 acre	187	18	11
	Olives: Picking for oil	38 tons	400.0 pounds	190	18	11
	Peaches--clingstone: Pruning	596 acres†	0.25 acre	2,384	18	133
	Peaches--freestone: Pruning	489 acres†	0.25 acre	1,956	18	109
	Plums: Pruning	236 acres†	0.5 acre	472	18	27
	Prunes: Pruning	64 acres†	0.25 acre	256	18	15
	Walnuts: Pruning	730 acres†	0.5 acre	1,460	18	82
	Totals			28,646	18	1,592 man-months ‡
February	Carrots for seed: Transplanting	14 acres	0.5 acre	28	19	2
	Onions for seed: Planting bulbs	63 acres	0.2 acre	315	19	17
	Carrots: Pulling, tying, and putting in crates	7,532 crates	12.0 crates	628	19	34

Table continued on next page.

Table 3 continued.

Month	Crop and task	Size of task	Output per man-day	Required man-days	Available days	Required number of workers*
February contd.	Peas--green: Hoeing	1,711 acres	1.0 acre	1,711	19	91
	Spinach: Hoeing	757 acres	0.75 acre	1,010	19	54
	Tomatoes: Transplanting	10,382,976 plants†	5,000.0 plants	2,077	9	231 (Feb. 15-28)
	Apricots: Pruning	433 acres†	0.25 acre	1,732	19	92
	Cherries: Pruning	1,759 acres	0.6 acre	2,932	19	155
	Grapes--Tokay and other table varieties: Pruning	3,736 acres†	0.5 acre	7,472	19	394
	Grapes--juice varieties: Pruning	6,486 acres†	0.75 acre	8,648	19	456
	Grapes--raisin varieties: Pruning	141 acres†	0.75 acre	188	19	10
	Olives: Picking for oil	10 tons	400.0 pounds	50	9	6 (Feb. 1-15)
	Peaches--clingstone: Pruning	596 acres†	0.25 acre	2,384	19	126
	Peaches--freestone: Pruning	488 acres†	0.25 acre	1,952	19	103
	Plums: Pruning	236 acres†	0.5 acre	472	19	25
	Prunes: Pruning	33 acres†	0.25 acre	132	19	7
	Walnuts: Pruning	730 acres†	0.5 acre	1,460	19	77
	Totals			33,191	19	1,747 man-months
March	Onions: Weeding	1,161 acres	〃	2,322	22	106
	Sugar beets: Thinning	197 acres	0.5 acre	394	22	18
	Carrots for seed: Hoeing	16 acres	0.75 acre	22	11	2 (Mar. 15-31)
	Lettuce for seed: Thinning and hoeing	14 acres	0.5 acre	28	11	3 (Mar. 15-31)
	Onions for seed: Hoeing	188 acres	〃	313	22	15
	Beets for seed: Hoeing	41 acres	0.75 acre	55	22	3
	Peas--green: Hoeing	1,711 acres	1.0 acre	1,711	22	78
	Spinach: Picking up and crating	2,875 tons	4.0 tons	719	11	66 (Mar. 15-31)
	Cherries: Pruning	1,099 acres	0.6 acre	1,832	22	84
	Grapes--Tokay and other table varieties: Hoeing	1,557 acres†	5.0 acres	312	11	29 (Mar. 15-31)
	Grapes--juice varieties: Hoeing	2,703 acres†	5.0 acres	541	11	50 (Mar. 15-31)
	Peaches--clingstone: Pruning	255 acres†	0.25 acre	1,020	11	93 (Mar. 1-15)
	Smudging	〃				(Mar. 24-31)

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Table 3 continued.

Month	Crop and task	Size of task	Output per man-day	Required man-days	Available days	Required number of workers*
March contd.	Peaches--freestone: Pruning	210 acres†	0.25 acre	840	11	77 (Mar. 1-15)
	Smudging	"				(Mar. 24-31)
	Plums: Pruning	59 acres†	0.5 acre	118	22	6
	Walnuts: Pruning	730 acres†	0.5 acre	1,460	22	67
	Totals			11,687	22	532 man-months
April	Alfalfa: Mowing with tractor	3,564 acres†	20.0 acres	179	11	17 (Apr. 15-30)
	Mowing with horses	3,563 acres†	7.5 acres	476	11	44 (Apr. 15-30)
	Raking	7,127 acres†	20.0 acres	357	11	33 (Apr. 15-30)
	Shocking with rake	7,127 acres†	30.0 acres	238	11	22 (Apr. 15-30)
	Onions: Weeding	1,161 acres	¢	4,644	22	212
	Potatoes--sweet: Planting	61 acres†	0.6 acre	102	4	26 (Apr. 25-30)
	Sugar beets: Thinning	296 acres	0.5 acre	592	22	27
	Sunflower: Thinning and hoeing	645 acres	1.0 acre	645	11	59 (Apr. 15-30)
	Carrots for seed: Hoeing	32 acres	0.75 acre	43	22	2
	Lettuce for seed: Thinning and hoeing	29 acres	0.5 acre	58	22	3
	Onions for seed: Hoeing	188 acres	¶	313	22	15
	Beets for seed: Hoeing first time	20 acres	0.75 acre	27	11	3 (Apr. 1-15)
	Hoeing second time	30 acres	1.5 acres	20	11	2 (Apr. 15-30)
	Peas--green: Picking	50,700 hampers	10.0 hampers	5,070	22	231
	Spinach: Picking up and crating	2,875 tons	4.0 tons	719	11	66 (Apr. 1-15)
	Apricots: Thinning	866 acres	0.25 acre	3,464	11	315 (Apr. 15-30)
	Grapes--Tokay and other table varieties: Hoeing	3,113 acres†	5.0 acres	623	22	29
	Grapes--juice varieties: Hoeing	5,405 acres†	5.0 acres	1,081	22	50
	Peaches--clingstone: Smudging	"				
	Peaches--freestone: Smudging	"				
	Plums: Thinning	1,180 acres	0.33 acre	3,576	11	326 (Apr. 15-30)
	Prunes: Thinning	145 acres†	0.2 acre	725	11	66 (Apr. 15-30)
	Walnuts: Spraying	2,188 acres†	3.0 acres	730	22	34
	Totals			23,682	22	1,077 man-months

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Table 3 continued.

Month	Crop and task	Size of task	Output per man-day	Required man-days	Available days	Required number of workers*
May	Alfalfa: Mowing with tractor	7,127 acres †	20 acres	357	24	15
	Mowing with horses	7,127 acres †	7.5 acres	951	24	40
	Raking	14,254 acres †	20.0 acres	713	24	30
	Shocking with rake	14,254 acres †	30.0 acres	476	24	20
	Baling	10,690 tons †	5.0 tons	2,138	24	90
	Hay--mostly grain hay: Mowing	11,625 acres †	7.5 acres	1,550	24	65
	Raking	11,625 acres †	15.0 acres	775	24	33
	Shocking	11,625 acres †	30.0 acres	388	24	17
	Baling	18,563 tons	5.0 tons	3,713	24	155
	Hops: Training vines	90 acres †	0.17 acre	540	24	23
	Onions: Weeding	1,161 acres	6	4,644	24	194
	Potatoes--sweet: Planting	348 acres †	0.6 acre	580	24	25
	Sugar beets: Thinning	296 acres	0.5 acre	592	24	25
	Sunflower: Thinning and hoeing	1,290 acres	1.0 acre	1,290	24	54
	Carrots for seed: Hoeing	32 acres	0.75 acre	43	24	2
	Lettuce for seed: Thinning and hoeing	15 acres	0.5 acre	30	12	3 (May 1-15)
	Hoeing	39 acres	0.5 acre	78	24	4
	Onions for seed: Hoeing	188 acres	4	314	24	14
	Beets for seed: Hoeing second time	31 acres	1.5 acres	21	12	2 (May 1-5)
	Cutting off top of seed stalks with knife	61 acres	5.0 acres	13	24	1
	Carrots: Pulling, tying, and putting in crates	32,280 crates	12.0 crates	2,690	24	113
	Cucumbers: Hoeing	150 acres	**	150	24	7
	Peas--green: Picking	118,300 hampers	10.0 hampers	11,830	24	493
	Tomatoes: Hoeing	6,009 acres	1.0 acre	6,009	24	251
	Apricots: Thinning	865 acres	0.25 acre	3,460	12	289 (May 1-15)
	Cherries: Picking for canning or barreling	1,261 tons	200.0 pounds	12,610	6	2,102 (May 24-31)
	Picking for shipping	116,000 lugs	12.0 lugs	9,667	24	403
	Packing for shipment	116,000 lugs	15.0 lugs	7,734	24	323
	Grapes--Tokay: Thinning	3,403 acres	0.33 acre	10,313	8	1,290 (May 20-31)

Table continued on next page.

Table 3 continued.

Month	Crop and task	Size of task	Output per man-day	Required man-days	Available days	Required number of workers*
May contd.	Peaches--clingstone: Thinning	2,552 acres	0.2 acre	12,760	24	532 (May 1-10)
	Smudging	//				
	Peaches--freestone: Thinning	2,794 acres	0.2 acre	13,970	24	583 (May 1-10)
	Smudging	//				
	Plums: Thinning	1,180 acres	0.33 acre	3,576	12	298 (May 1-15)
	Prunes: Thinning	145 acres†	0.2 acre	725	12	61 (May 1-15)
	Walnuts: Spraying	2,188 acres†	3.0 acres	730	24	31
	Strawberries: Picking	16,800 crates†	12.0 crates	1,400	24	59
	Totals			116,830	24	4,868 man-months
June	Alfalfa: Mowing with tractor	7,127 acres†	20.0 acres	357	26	14
	Mowing with horses	7,127 acres†	7.5 acres	951	26	37
	Raking	14,254 acres†	20.0 acres	713	26	28
	Shocking with rake	14,254 acres†	30.0 acres	476	26	19
	Baling	10,690 tons†	5.0 tons	2,138	26	83
	Grain: Harvesting	61,935 acres†	7.0 acres	8,848	26	341
	Hay--mostly grain hay: Mowing	1,292 acres†	7.5 acres	173	6	29 (June 1-7)
	Raking	1,292 acres†	15.0 acres	87	6	15 (June 1-7)
	Shocking	1,292 acres†	30.0 acres	44	6	8 (June 1-7)
	Baling	18,563 tons	5.0 tons	3,713	26	143
	Hops: Training vines	45 acres†	0.17 acre	270	13	21 (June 1-15)
	Potatoes--sweet: Hoeing	204 acres†	4.0 acres	51	26	2
	Sugar beets: Thinning	197 acres	0.5 acre	394	26	16
	Hoeing	986 acres	1.5 acres	658	26	26
	Lettuce for seed: Hoeing	19 acres	0.5 acre	38	13	3 (June 1-15)
	Carrots: Pulling, tying, and putting in crates	36,584 crates	12.0 crates	3,049	26	118
	Cucumbers: Hoeing	150 acres	**	150	26	6
	Tomatoes: Hoeing	6,009 acres	1.0 acre	6,009	26	232
	Apricots: Picking	5,342 tons	1,750.0 pounds	6,106	17	360 (June 10-30)
	Cutting for drying	2,670 tons	1,000.0 pounds	5,340	17	315 (June 10-30)
	Other dry-yard labor	2,289 tons	††	2,516	17	148 (June 10-30)
	Cherries: Picking for canning or barreling	1,261 tons	200. pounds	12,610	6	2,102 (June 1-7)
	Picking for shipping	174,000 lugs	12.0 lugs	14,500	26	558
	Packing for shipment	174,000 lugs	15.0 lugs	11,600	26	447

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Table 3 continued.

Month	Crop and task	Size of task	Output per man-day	Required man-days	Available days	Required number of workers*
June cont'd.	Grapes--Tokay: Thinning	5,015 acres	0.33 acre	15,197	13	1,169 (June 1-15)
	Peaches--clingstone: Thinning	851 acres	0.2 acre	4,255	13	328 (June 15-30)
	Plums: Picking	3,398 crates	25.0 crates	136	6	23 (June 24-30)
	Strawberries: Picking	6,300 crates†	12.0 crates	525	26	21
	Totals			100,904	26	3,881 man-months
July	Alfalfa: Mowing with tractor	7,127 acres†	20.0 acres	357	26	14
	Mowing with horses	7,127 acres†	7.5 acres	951	26	37
	Raking	14,254 acres†	20.0 acres	713	26	28
	Shocking with rake	14,254 acres†	30.0 acres	476	26	19
	Baling	10,690 tons†	5.0 acres	2,138	26	83
	Grain: Harvesting	26,544 acres†	7.0 acres	3,792	26	146
	Onions: Pulling, topping, and sacking	58,050 cwt.	30.0 cwt.	1,935	9	215 (July 20-31)
	Potatoes--sweet: Hoeing	204 acres†	4.0 acres	51	26	2
	Sugar beets: Hoeing	986 acres	1.5 acres	658	26	26
	Lettuce for seed: Cutting and throwing on wagons	6 acres	0.33 acre	19	26	1
	Onions for seed: Picking	126 acres	0.2 acre	630	9	70 (July 20-31)
	Cucumbers: Picking	150 acres	‡‡	1,200	16	75 (July 15-31)
	Tomatoes: Hoeing	6,009 acres	1.0 acre	6,009	26	232
	Picking for shipping	22,100 lugs	45.0 lugs	492	26	19
	Watermelons: Picking	3,330 tons	20.0 tons	167	17	10 (July 10-31)
	Cantaloupes: Picking	23,184 crates	40.0 crates	580	26	23
	Apricots: Picking	2,289 tons	1,750.0 pounds	2,616	13	202 (July 1-15)
	Cutting for drying	1,145 tons	1,000.0 pounds	2,290	13	177 (July 1-15)
	Other dry-yard labor	1,526 tons	††	1,677	13	129 (July 1-15)
	Peaches--freestone: Picking for shipping	597 tons	1.0 tons	597	9	67 (July 20-30)
	Packing	597 tons	1.5 tons	398	9	45 (July 20-30)
	Plums: Picking	227,693 crates	25.0 crates	9,108	26	351
	Prunes: Picking up	227 tons	1,500.0 pounds	303	13	24 (July 15-31)
	Dipping and drying	57 tons†	1.2 tons	48	13	4 (July 15-31)
	Totals			37,205	26	1,431 man-months

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Table 3 continued.

Month	Crop and task	Size of task	Output per man-day	Required man-days	Available days	Required number of workers*
August	Alfalfa: Mowing with tractor	7,127 acres†	20.0 acres	357	26	14
	Mowing with horses	7,127 acres†	7.5 acres	951	26	37
	Raking	14,254 acres†	20.0 acres	713	26	28
	Shocking with rake	14,254 acres†	30.0 acres	476	26	19
	Baling	10,690 tons†	5.0 tons	2,138	26	83
	Hops: Picking	384,000 pounds§§	200.0 pounds §§	1,920	20	96 (Aug. 7-31)
	Drying	192,000 pounds† §§	2,800.0 pounds§§	69	20	4 (Aug. 7-31)
	Onions: Pulling, topping, and sacking	116,100 cwt.	30.0 cwt.	3,870	26	149
	Potatoes--sweet: Picking up, piling, breaking, and boxing	41 acres†	0.15 acre	274	13	22 (Aug. 15-31)
	Sugar beets: Hoeing	986 acres	1.5 acres	658	26	26
	Sunflowers: Cutting off heads by hand	387 acres	1.0 acre	387	13	30 (Aug. 15-31)
	Carrots for seed: Cutting by hand and piling	20 acres	0.4 acre	50	9	6 (Aug. 20-31)
	Lettuce for seed: Cutting and throwing on wagons	46 acres	0.33 acre	140	26	6
	Threshing, rough screening, and sacking	23 acres †	0.5 acre	46	26	2
	Onions for seed: Picking	62 acres	0.2 acre	310	4	78 (Aug. 1-5)
	Threshing, screening, and sacking	94 acres†	0.4 acre	235	26	10
	Beets for seed: Cutting off branches and laying in piles	61 acres	0.5 acre	122	26	5
	Threshing	39 acres†	1.8 acres	22	13	2 (Aug. 15-30)
	Cucumbers: Picking	150 acres	‡ †	2,325	31	75
	Tomatoes: Picking for canning	5,732 tons	1,500 pounds	7,643	26	294
	Picking for shipping	39,000 lugs	45.0 lugs	867	26	34
	Watermelons: Picking	6,660 tons	20.0 tons	333	26	13
	Cantaloupes: Picking	2,576 crates	40.0 crates	65	6	11 (Aug. 1-7)
	Almonds: Knocking	613,000 pounds	300.0 pounds	2,044	13	158 (Aug. 15-31)
	Hulling by machine	306,500 pounds†	500.0 pounds	613	13	48 (Aug. 15-31)

Table continued on next page.

Table 3 continued.

Month	Crop and task	Size of task	Output per man-day	Required man-days	Available days	Required number of workers*
August cont'd.	Peaches--clingstone: Picking	17,151 tons	1.0 ton	17,151	26	660
	Cutting for drying	2,572 tons	600.0 pounds	8,574	26	330
	Other dry-yard labor	2,411 tons	††	2,772	26	107
	Peaches--freestone: Picking for shipping	1,990 tons	1.0 ton	1,990	26	77
	Packing	1,990 tons	1.5 tons	1,327	26	52
	Picking for drying	11,945 tons	1.5 tons	7,964	26	307
	Cutting for drying	11,945 tons	1.0 ton	11,945	26	460
	Other dry-yard labor	9,556 tons	††	10,984	26	423
	Plums: Picking	108,749 crates	25.0 crates	4,350	26	168
	Prunes: Picking up	1,360 tons	1,500.0 pounds	1,814	26	70
	Dipping and drying	340 tons†	1.2 tons	284	26	11
	Totals			95,783	26	3,684 man-months
September	Alfalfa: Mowing with tractor	7,127 acres †	20.0 acres	357	25	15
	Mowing with horses	7,127 acres †	7.5 acres	951	25	39
	Raking	14,254 acres †	20.0 acres	713	25	29
	Shocking with rake	14,254 acres †	30.0 acres	476	25	20
	Baling	10,690 tons †	5.0 tons	2,138	25	86
	Hops: Baling	57,600 pounds †	12.0 bales	4,800	6	800 (Sept. 1-7)
	Onions: Pulling, topping, and sacking	58,050 cwt.	30.0 cwt.	1,935	13	149 (Sept. 1-15)
	Potatoes--sweet: Picking up, piling, breaking, and boxing	164 acres †	0.15 acre	1,094	25	44
	Rice: Windrowing	273 acres †	10.0 acres	28	12	3 (Sept. 15-30)
	Threshing with pick-up combine	164 acres †	4.5 acres	365	12	31 (Sept. 15-30)
	Picking up sacks and hauling from field	8,528 sacks	500.0 sacks	18	12	2 (Sept. 15-30)
	Sugar beets: Harvesting	3,352 tons	6.0 tons	559	25	23
	Sunflowers: Cutting off heads by hand	1,161 acres	1.0 acre	1,161	25	47
	Picking up and piling heads	967 acres	1.0 acre	967	25	39
	Threshing	774 acres †	5.0 acres	155	25	7

Table continued on next page.

Table 3 continued.

Month	Crop and task	Size of task	Output per man-day	Required man-days	Available days	Required number of workers*
September cont'd.	Carrots for seed: Cutting by hand and piling	20 acres	0.4 acre	50	13	4 (Sept. 1-20)
	Threshing, screening, and sacking	20 acres†	0.33 acre	61	25	3
	Lettuce for seed: Cutting and throwing on wagons	6 acres	0.33 acre	19	25	1
	Threshing, rough screening, and sacking	6 acres†	0.5 acre	12	25	1
	Beets for seed: Threshing	10 acres†	1.8 acres	6	6	1 (Sept. 1-7)
	Cucumbers: Picking	150 acres	‡‡	1,125	15	75
	Tomatoes: Picking for canning	17,194 tons	1,500 pounds	22,926	25	918
	Picking for shipping	78,000 lugs	45.0 lugs	1,734	25	70
	Watermelons: Picking	1,110 tons	20.0 tons	56	13	5 (Sept. 1-15)
	Almonds: Knocking	1,226,000 pounds	300.0 pounds	4,087	25	164
	Hulling by machine	613,000 pounds†	500.0 pounds	1,226	25	50
	Grapes--Tokay and other table varieties: Picking and packing	840,105 lugs	30.0 lugs	28,004	25	1,121
	Picking for winery	11,228 tons	2.0 tons	5,614	25	225
	Grapes--juice varieties:					
	Picking for shipping	19,020 tons	1.0 ton	19,020	25	761
	Picking for winery	23,252 tons	2.0 tons	11,626	25	466
	Grapes--raisin varieties: Picking	2,400 tons	1.2 tons	2,000	12	167 (Sept. 15-30)
	Peaches--clingstone: Picking	4,288 tons	1.0 ton	4,288	8	536 (Sept. 1-10)
	Cutting for drying	643 tons	600.0 pounds	2,144	8	268 (Sept. 1-10)
	Other dry-yard labor	804 tons	††	925	13	72 (Sept. 1-15)
	Peaches--freestone: Picking for shipping	1,194 tons	1.0 ton	1,194	25	48
	Packing	956 tons	1.5 tons	638	25	26
	Other dry-yard labor	2,389 tons	††	2,746	6	458 (Sept. 1-7)
	Prunes: Picking up	227 tons	1,500.0 pounds	303	13	24 (Sept. 1-15)
	Dipping and drying	57 tons†	1.2 tons	48	13	4 (Sept. 1-15)
	Walnuts: Knocking off and picking up	1,510 tons	300.0 pounds	10,067	25	403
	Totals			135,636	25	5,426 man-months

Table continued on next page.

Table 3 continued.

Month	Crop and task	Size of task	Output per man-day	Required man-days	Available days	Required number of workers*
October	Alfalfa: Mowing with tractor	3,564 acres†	20.0 acres	179	12	15 (Oct. 1-15)
	Mowing with horses	3,563 acres†	7.5 acres	476	12	40 (Oct. 1-15)
	Raking	7,127 acres†	20.0 acres	357	12	30 (Oct. 1-15)
	Shocking with rake	7,127 acres†	30.0 acres	238	12	20 (Oct. 1-15)
	Baling	10,690 tons†	5.0 tons	2,138	23	93
	Corn--field: Picking, husking, and hauling to cribs	259 acres	0.75 acre	346	23	16
	Grain sorghums: Harvesting with combine	1,740 acres†	2.5 acres	696	23	31
	Cutting off heads by hand	1,740 acres†	1.0 acre	1,740	23	76
	Threshing with stationary machine	2,175 tons†	100.0 cwt.	435	23	19
	Potatoes--sweet: Picking up, piling, breaking, and boxing	164 acres	0.15 acre	1,094	23	48
	Rice: Windrowing	547 acres†	10.0 acres	55	23	3
	Threshing with pick-up combine	656 acres†	4.5 acres	146	23	7
	Picking up sacks and hauling from field	34,112 sacks	500.0 sacks	69	23	3
	Sugar beets: Harvesting	4,190 tons	6.0 tons	699	23	31
	Sunflowers: Cutting off heads by hand	387 acres	1.0 acre	387	23	17
	Picking up and piling heads	968 acres	1.0 acre	968	23	43
	Threshing	774 acres†	5.0 acres	155	23	7
	Tomatoes: Picking for canning	15,284 tons	1,500 pounds	20,379	23	887
	Picking for shipping	52,000 lugs	45 lugs	1,156	23	51
	Grapes--Tokay and other table varieties: Picking and packing	1,527,465 lugs	30.0 lugs	50,916	23	2,214
	Picking for winery	56,140 tons	2.0 tons	28,070	23	1,221
	Grapes--juice varieties:					
	Picking for shipment	34,583 tons	1.0 ton	34,583	23	1,504
	Picking for winery	31,002 tons	2.0 tons	15,501	23	674

Table continued on next page.

Table 3 continued.

Month	Crop and task	Size of task	Output per man-day	Required man-days	Available days	Required number of workers*
October cont'd.	Grapes--raisin varieties:					
	Picking	600 tons	1.2 tons	500	6	84 (Oct. 1-7)
	Olives: Picking for pickling	135 tons	275.0 pounds	9,819	11	893 (Oct. 15-30)
	Peaches--freestone: Picking for shipping	200 tons	1.0 ton	200	23	9
	Packing	200 tons	1.5 pounds	134	23	6
	Walnuts: Knocking off and picking up	503 tons	300.0 pounds	3,354	12	280 (Oct. 1-15)
	Totals			174,790	23	7,600 man-months
November	Corn--field: Picking, husking, and hauling to cribs	690 acres	0.75 acre	920	23	40
	Potatoes--sweet: Picking up, piling, breaking, and boxing	40 acres†	0.15 acre	267	12	23 (Nov. 1-15)
	Sugar beets: Harvesting	4,190 tons	6.0 tons	699	23	31
	Carrots: Pulling, tying, and harvesting	4,304 crates	12.0 crates	359	23	16
	Tomatoes: Picking for shipping	5,200 lugs	45.0 lugs	116	23	6
	Cherries: Pruning	220 acres	0.6 acre	367	23	16
	Grapes--Tokay and other table varieties: Picking and packing	178,204 lugs	30.0 lugs	5,941	12	496 (Nov. 1-15)
	Picking for winery	44,912 tons	2.0 tons	22,456	23	977
	Grapes--juice varieties:					
	Picking for shipping	4,035 tons	1.0 ton	4,035	12	337 (Nov. 1-15)
	Picking for winery	23,252 tons	2.0 tons	11,626	23	506
	Olives: Picking for pickling	405 tons	275.0 pounds	2,946	23	128
	Plums: Pruning	59 acres†	0.5 acre	118	23	6
	Totals			49,850	23	2,168 man-months
December	Corn--field: Picking, husking, and hauling to cribs	690 acres	0.75 acres	920	19	49
	Sugar beets: Harvesting	5,030 tons	6.0 tons	839	19	45
	Carrots for seed: Transplanting	13 acres	0.5 acre	26	19	2

Table continued on next page.

Table 3 continued.

Month	Crop and task	Size of task	Output per man-day	Required man-days	Available days	Required number of workers*
December cont'd.	Onions for seed: Planting bulbs	62 acres	0.2 acre	310	19	17
	Beets for seed: Planting	15 acres	0.75 acre	20	19	2
	Carrots: Pulling, tying, and putting in crates	13,988 crates	12.0 crates	1,166	19	62
	Tomatoes: Picking for shipping	3,900 lugs	45.0 lugs	87	19	5
	Apricots: Pruning	433 acres†	0.25 acre	1,732	19	92
	Cherries: Pruning	440 acres	0.6 acre	734	19	39
	Grapes--Tokay and other table varieties: Pruning	1,868 acres†	0.5 acre	3,736	19	197
	Grapes--juice varieties: Pruning	3,243 acres†	0.75 acre	4,324	19	228
	Grapes--raisin varieties: Pruning	70 acres†	0.75 acre	94	19	5
	Olives: Picking for oil	38 tons	400.0 pounds	190	19	10
	Peaches--clingstone: Pruning	255 acres†	0.25 acre	1,020	19	54
	Peaches--freestone: Pruning	210 acres†	0.25 acre	840	19	45
	Prunes: Pruning	64 acres†	0.25 acre	256	19	14
	Totals			16,294	19	858

* On a monthly basis unless otherwise noted.

† Portion of task performed by seasonal help.

‡ It should be noted that this figure, rather than representing the total number of individuals required, represents the number of man-months of labor required and is derived by dividing the total number of man-days by the number of days available for work during the month.

ϕ It is estimated that a total of 10 man-days per acre is required for weeding onions, which is divided approximately as follows: 2 man-days per acre in March, 4 man-days per acre in April, and 4 man-days in May.

¶ Hoeing onions for seed requires a total of 50 man-hours per acre, which is distributed equally through March, April, and May.

Footnotes continued on next page.

Footnotes to table 3 continued.

|| Smudging is done on a portion of the acreage only and only when necessary, and requires that one person be available on call for each 10 acres to be smudged.

** A total of 20 man-hours per acre is required for hoeing cucumbers, half in May and half in June.

†† Dry-yard labor, other than cutting, is estimated to be as follows:

Apricots -- 11 man-hours per fresh ton.
Peaches -- 11.5 man-hours per fresh ton.

‡‡ Cucumber picking requires 1 man on each 2 acres continuously from July 15 to September 15.

§§ Green weight.

TABLE 4

Summary of Seasonal Labor Needs by Months
San Joaquin County
1935

Month	Required man-days of seasonal labor	Available work days	Required man-months of seasonal labor
January	28,646	18	1,592
February	33,191	19	1,747
March	11,687	22	532
April	23,682	22	1,077
May	116,830	24	4,868
June	100,904	26	3,881
July	37,205	26	1,431
August	95,783	26	3,684
September	135,636	25	5,426
October	174,790	23	7,600
November	49,850	23	2,168
December	16,294	19	858
Total	824,498	--	34,864

Notes

Notes on Table 2.-- Data concerning "time of need" as shown in this table break down required seasonal labor into the period in which the work is performed in order to permit a subsequent determination of labor needs by months (table 3). Some operations are performed only to a limited extent with seasonal labor. For instance, only abour 60 per cent of the labor in harvesting grain is done by seasonal workers.

The amount of work done each month is based on the cropping system followed during 1935. The allotting of amounts of work is based on findings concerning local farm practices, and required time to "make" a crop resulting from inquiry of producers, and records of carlot shipments, the latter proving helpful in fixing dates of planting and of subsequent tasks involved in producing certain crops. Proportionate amounts of output harvested each month were determined from data of local practices with respect to harvesting, and from carlot shipments of perishable products. Records of truck shipments were also used when available.

Notes on Table 3.-- Table 3 is the condensed summary of labor needs as worked out for San Joaquin County as a result of findings pertinent to 1935. The data are presented by months with the tasks which were performed in each month indicated by both crop and task. The size of the job was calculated from the data appearing in table 1 (acreage and production) and table 2 (task, time of performance, and percentage of work pertinent to a given month). The output per man-day was calculated as indicated in the foreword presenting table 3. The number of required man-days is a result of dividing the size of task by output per man-day. The available days for the different tasks involve two variables. The first is the number of days when field work is possible because of favorable weather conditions. The basis for this column was determined from a study of the monthly weather charts of the United States Weather Bureau of the years 1933, 1934, and 1935. These data indicated available days per month as follows (based on a 26-day working month without allowance for holidays):

Month	Available days	Length of work day	Month	Available days	Length of work day
		hours			hours
January	18	9	July	26	10
February	19	9	August	26	10
March	22	10	September	25	10
April	22	10	October	23	10
May	24	10	November	23	9
June	26	10	December	19	9

Source of data:

Based on precipitation records of the Stockton station of the United States Weather Bureau for the years 1933, 1934, and 1935.

The second factor influencing the number of available days was the size of the job. If the output was only a few cars, then the number of days was limited to the time needed to get out those cars efficiently. If a field operation had to be performed in a period less than the number of available days in the month, then the specific number of days was noted. These restrictions are shown in parentheses. For example, in July picking of apricots was limited to the first half

of the month, picking cucumbers to the last half, etc.

The totals of table 3 show the total required man-days of needed seasonal labor, the available days for field work during the month, and the necessary number of men (as defined in the opening paragraph of table 3) required on a monthly basis to care for the tasks ordinarily performed by seasonal workers.

In an area such as San Joaquin County, involving a variety of annual crops, the findings as set forth in this report are bound to fluctuate materially from year to year, because of the market outlook upon what and how much acreage is planted, and when it is planted; because of variable seasonal conditions affecting yields, time of performing operations, and available days; and because of harvesting operations on certain crops being speeded up to supply a good market, or retarded to avoid a poor one, resulting in marked variations in the need for harvest labor.

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